Appendix G

Practical Application of Assessing Environmental-Related Risk

This appendix provides a practical application of assessing environmental -related risk. This exercise uses the five-step process of risk management described in Chapter 4. This exercise also employs the risk management worksheet to document and track risk. Although the following scenario depicts a field training exercise (FTX), units use these procedures to assess environmental-related risk during all operations. This scenario concentrates specifically on environmental-related risk; however, these risks are incorporated into the company's overall risk management plan.

The 586th Assault Float Bridge (AFB) Company will conduct a five-day FTX in Anatuvak training area of Camp Yukon. The unit will depart Fort Chilly and convoy 120 miles on limited access highways. The commander has designated rest areas and tactical refueling points along the route. The trip is expected to take 8 hours. Upon arrival at Camp Yukon, the unit will move into the Anatuvak training area and set up a bivouac site, preceeded by their quartering party. During the FTX, the company will conduct tactical bridging operations on the Yukon River. The FTX will involve normal operations (12 to 16 hours a day), with some night and limited visibility operations. The operations will include the use of pyrotechnics and blank ammunition, but no live fire will be conducted. The area has hills, wetlands, several winding streams, and one large river. The wetlands are identified and marked. The forecasted weather will not adversely affect operations. The soldiers are somewhat familiar with the terrain, which contains some identified and marked off archaeological sites. The training area contains the habitat for two endangered species, which are marked and posted. The unit will conduct unit maintenance, refueling, messing, shower, and field sanitation operations within the bivouac site.

STEP 1. IDENTIFY (ENVIRONMENTAL) HAZARDS

To ensure risk management throughout the operation, the unit's XO (Lieutenant Young) conducted an operational analysis to break down the exercise into events, allowing him to manage the risks for the various tasks. He also identified particular tasks for the operation using the company's mission training plan (MTP). Figure G-1, page G-1 illustrates the unit's prepared operational analysis.

Leaders developed the hazard list using their experience, lessons learned, unit SOPs, applicable references, and guidance from the chain of command. The unit consulted Fort Chilly's and Camp Yukon's installation and operational staffs to obtain more information on the environmental considerations for the area of operations. They identified applicable environmental standards, laws, and ROE that effected the mission.

Company leaders annotated each task and associated environmental hazards on the risk management worksheet in Figure G-2, page G-4, sections E and F. For the purposes of this practical example, only the high profile tasks (2, 3, and 4) are detailed in the worksheet.

1. Conduct preexecution checks.
2. Conduct convoy operations to Camp Yukon.
3. Establish a bivouac:
    - Conduct quartering party operations.
    - Establish a defensive perimeter.
    - Conduct refueling operations.
    - Conduct mess operations.
    - Establish field latrines.
    - Establish field maintenance operations.
4. Plan and direct assault float bridge (AFB) construction.
5. Prepare for redeployment.
6. Conduct convoy operations to Ft. Chilly.
7. Conduct recovery operations.
8. Conduct AAR.

Figure G-1. Operational analysis

STEP 2. ASSESS (ENVIRONMENTAL) HAZARDS

Unit leaders assessed each hazard to determine the risk for potential harm to the environment. Their assessment was based upon how often the environmental hazard occurred during the operation (probability) and what effect the hazard had on the environment (severity). They used the probability and severity definitions from Figures 2-10 and 2-11, page 2-21 and 2-22. Leaders determined the initial risk of each hazard by applying the risk assessment matrix in Figure 2-12, page 2-22 and 2-23. The unit commander informed his staff to be sensitive to tactical bridging operations and their effects on the Yukon River and surrounding areas. Each hazard assessment was annotated in section G, (Figure G-2, page G-2). See Figures G-2 through G-7, pages G-3 to G-8, for samples of a completed worksheet.

STEP 3. DEVELOP CONTROLS AND MAKE A DECISION

Unit leaders developed controls to eliminate or reduce the probability or severity of each hazard. They identified a mix of educational-, physical-, and avoidance-type controls and annotated them in section H (Figure G-2). Once all risk control measures were in place, some risk remained. This residual risk was annotated in section I (Figure G-2). Unit leaders informed the chain of command and appropriate commander of the residual risk and its implications for the operation. The commander was concerned about the environmental hazards associated with the bridging operations and directed his staff to consider additional controls. The staff developed additional controls and presented the revised risk assessment to the commander, thereby further reducing the residual risk. The commander agreed that the new controls were sufficient and decided the residual risk was acceptable.

STEP 4. IMPLEMENT CONTROLS

Leaders identified how each control would be implemented and assigned responsibility to unit personnel. The "how to" for each control was annotated in section J (Figure G-2). For example, fueling bridge boats during bridging operations was a major concern for the company. Leaders identified several control measures to include ensuring that operators were properly trained to dispense fuel, appropriate spill equipment was available, and all fueling of boats was completed while the boats were still on the trucks before launch. This step required leaders to anticipate environmental requirements and incorporate them as part long-range, short-range, and near-term planning. The residual risk determination was annotated in section K (Figure G-2).

STEP 5. SUPERVISE AND EVALUATE

Leaders and staff continuously monitored controls throughout the operation to ensure their effectiveness and modified controls as required. Leaders made on-the-spot corrections and evaluated individual and collective performances. They held those in charge accountable and ensured that all tasks were performed to applicable standards. Leaders discussed the evaluation of environmental-related hazards, controls, soldier performance, and leader supervision during AARs to ensure the development of environmental lessons learned, for use in future operations.

SUMMARY

The 586th AFB Company leadership properly managed environmental-related risk during their operation by accurately identifying potential environmental hazards, developing controls, making risk decisions, implementing controls, and ensuring proper supervision and evaluation. Due to effective risk management, the company successfully completed the mission and minimized their company's impact on the environment.

Remember to look at the linkage of the environmental hazard assessment and its associated impact on safety, force protection, and force health protection as part of your overall risk management plan.

A. Mission or Task:	B. Date/Time Group	C. Date Prepared:
586th Engineer Company FTX	Begin: 010600RJunXX End: 061200RJunXX	22 May XX

D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO

Page 1 of 6

E. Task:	F. Identify Hazards:	G. Assess Hazards:	H. Develop Controls:	I. Determine Residual Risk:	J. Implement Controls ("How To"):
Conduct convoy operations from Fort Chilly to Camp Yukon	Vehicle accidents and breakdowns causing spill of fuel and HM	Moderate (M)	1. Train all drivers on proper actions to take during a spill. • Protect yourself and other personnel. • Stop the flow. • Notify chain of command. • Confine the spill. 2. Provide vehicle spill equipment.	Low (L)	TACSOP, para 8(a), OPORD - train all drivers before the exercise. Supply NCO will order and issue vehicle spill equipment. Platoon leaders will brief all soldiers before the convoy. (ARTEP 5-145-32. MTP 05-2-1030).
	Spills during refueling stops	Moderate (M)	1. Train all fuel handlers on proper refueling procedures. 2. Provide spill equipment. 3. Ensure that only fuel handlers will dispense fuel. 4. Locate refueling sites away from bodies of water and wetland areas.	Low (L)	TACSOP, para 11(a), OPORD - support platoon leader will check status of spill equipment and brief all soldiers before the convoy on refueling procedures. (FM 10-71, FM 3-100.4, ARTEP 5-145-32, MTP 05-2-1024).
	Maneuver damage from off-road movement	Moderate (M)	1. Brief all drivers to stay on primary and secondary roads. 2. Identify all sensitive areas and habitat along the route. 3. Conduct prior route recon.	Low (L)	TACSOP, para 9(a), OPORD - provide all drivers with strip map marking route and sensitive areas; leaders account for all vehicles at halts. (ARTEP 5-145-32, MTP 05-2-1030).

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-2. Sample of completed worksheet for tactical bivouac

A. Mission or Task:	B. Date/Time Group	C. Date Prepared:
586th Engineer Company FTX	Begin: 010600RJunXX End: 061200RJunXX	22 May XX

D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO

Page 2 of 6

E. Task:	F. Identify Hazards:	G. Assess Hazards:	H. Develop Controls:	I. Determine Residual Risk:	J. Implement Controls ("How To"):
Establish a tactical bivouac	Maneuver damage from off-road movement	Moderate (M)	1. Use quartering party to direct vehicles and equipment into the bivouac site. 2. Identify and mark all sensitive areas within the bivouac area. 3. Avoid using areas with endangered and threatened species. 4. Provide maneuver-damage control team.	Low (L)	TACSOP, para 11a), OPORD - XO will lead quartering party, Camp Yukon range control map. (ARTEP 5-145-32, MTP 05-2-0908, FM 71-1, FM 20-400).
	Spills from tactical refueling operations	Moderate (M)	1. Train all fuel handlers on proper refueling procedures. 2. Provide spill equipment. 3. Ensure that only fuel handlers will dispense fuel. 4. Locate refueling sites away from bodies of water and wetland areas.	Low (L)	TACSOP, para 11(a), OPORD - support platoon leader will check status of spill equipment and brief all soldiers before the convoy on refueling procedures. (FM 10-71, FM 3-100.4, ARTEP 5-145-32, MTP 05-2-1024).
	HM spills from vehicle-maintenance operations	Moderate (M)	1. Brief all personnel on proper waste-accumulation site and field PMCS procedures. 2. Provide spill equipment. 3. Provide secondary containment for all drums and containers.	Low (L)	TACSOP, para 12(a), OPORD - TM 38-410, Camp Yukon Environmental and Range regulations. (FM 43-5, ARTEP 5-145-32, MTP 05-2-1131, ARTEP 5-145-32, MTP 05-2-1005).

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-3. Sample of completed worksheet for tactical bivouac (continued)

A. Mission or Task: 586th Engineer Company FTX	B. Date/Time Group Begin: 010600RJunXX End: 061200JunXX	C. Date Prepared: 22 May XX
D. Prepared By: (Rank, Last name, Duty Position) 1 LT Young, XO		Page 3 of 6

E. Task:	F. Identify Hazards:	G. Assess Hazards:	H. Develop Controls:	I. Determine Residual Risk:	J. Implement Controls ("How To"):
Establish a tactical bivouac (continued)	Digging in sensitive and restriced areas	Moderate (M)	1. Dig only in approved areas confirmed by range control. 2. Identify and mark all sensitive areas and habitats within the AO. 3. Site all fighting positions to avoid sensitive areas. 4. Fill in all excavations upon departure.	Low (L)	TACSOP, para 7(a), OPORD – FM 7-10, Camp Yukon Environmental and Range Regulations (ARTEP 5-145-32, MTP 05-2-0913).
	Starting range and training area fires	Moderate (M)	1. Inform soldiers that no open fires are allowed. 2. Provide fire-prevention equipment at refueling, messing, maintenance, and other specified locations in OPORD. 3. Brief soldiers on the proper use of pytotechnics, smoke pots, and grenades.	Low (L)	TACSOP, para 7(a), OPORD – FM 7-10, Camp Yukon Environmental and Range Regulations (ARTEP 5-145-32, MTP 05-2-0917).
	Polluting water sources form field latrines and mess operations	Moderate (M)	1. Coordinate for "port-a-potty" units from range control. 2. Recover all mess operations waste (grease, trash). 3. Inform soldiers of proper field sanitation techniques. 4. Train field sanitation teams. 5. Establish trash collection points.	Low (L)	TACSOP, para 7(a), OPORD – FM 7-10, Camp Yukon Environmental and Range Regulations (FM 21-10, FM 10-23, ARTEP 5-145-32, MTP 05-2-1031, ARTEP 5-145-32, MTP 05-2-1009).

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-4. Sample of complete worksheet for tactical bivouac (continued)

A. Mission or Task:	B. Date/Time Group	C. Date Prepared:
586th Engineer Company FTX	Begin: 010600RJunXX End: 061200RJunXX	22 May XX
D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO		Page 4 of 6

E. Task:	F. Identify Hazards:	G. Assess Hazards:	H. Develop Controls:	I. Determine Residual Risk:	J. Implement Controls ("How To"):
Establish a tactical bivouac (continued)	Leaving litter and debris in training areas	Moderate (M)	1. Ensure that leaders conduct daily inspections of the bivouac area. 2. Brief soldiers on trash-collection points and procedures. 3. Conduct periodic police calls of area. 4. Ensure that leaders account for all equipment, supplies, wire, trash, and wastes before departing an area.	Low (L)	TACSOP, para 7(a), OPORD - FM 7-10, Camp Yukon Environmental and Range Regulations - First Sergeant will coordinate training area final inspection with range control.

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-5. Sample of completed worksheet for tactical bivouac (continued)

A. Mission or Task:	B. Date/Time Group	C. Date Prepared:
586th Engineer Company FTX	Begin: 010600RJunXX End: 061200RJunXX	22 May XX

D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO

Page 5 of 6

E. Task:	F. Identify Hazards:	G. Assess Hazards:	H. Develop Controls:	I. Determine Residual Risk:	J. Implement Controls ("How To"):
Plan and direct assault float-bridge construction	Maneuver damage and erosion to entry and exit banks	High (H)	1. Conduct operations only in approved areas. 2. Use recon party to identify and mark all sensitive areas and routes within the AO. 3. Use vehicle guides to direct vehicles and equipment into the AO. 4. Control vehicle speeds and movements. 5. Harden and stabilize entry and exit points to minimize erosion and maximize mobility.	Moderate (M)	TACSOP, para 13(a), OPORD - FM 90-13, Camp Yukon Environmental and Range Regulations (TM 5-5420-209-12, TM 5-1940-277-10, ARTEP 5-145-32, MTP 05-2-0605).
	Spill into river from over-the-water boat refueling and fueling of tactical vehicles near river	High (H)	1. Train all fuel handlers on proper refueling procedures. 2. Provide spill equipment. 3. Ensure that only fuel handlers will dispense fuel. 4. Locate refueling site away from bodies of water and wetland areas. 5. Ensure that there will be no over-the-water refueling.	Moderate (M)	TACSOP, para 13(a), OPORD - FM 90-13, Camp Yukon Environmental and Range Regulations (FM 10-71, TM 5-5420-209-12, TM 5-1940-277-10, ARTEP 5-145-32, MTP 05-2-0605).
	Oil and greasy water bilged from bridge-erection boats into river	High (H)	1. Brief all boat operators concerning proper bilging procedures. 2. Provide spill equipment for each boat. 3. Steam clean each engine compartment before FTX.	Moderate (M)	TACSOP, para 13(a), OPORD - FM 90-13, Camp Yukon Environmental and Range Regulations (TM 5-5420-209-12).

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-6. Sample of completed worksheet for float-bridge construction

A. Mission or Task:	B. Date/Time Group	C. Date Prepared:
586th Engineer Company FTX	Begin: 010600RJunXX End: 061200RJunXX	22 May XX

D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO

Page 6 of 6

E. Task:	F. Identify Hazards:	G. Assess Hazards:	H. Develop Controls:	I. Determine Residual Risk:	J. Implement Controls ("How To"):
Plan and direct assault float-bridge construction (continued)	Maneuvering in threatened and endangered species habitat and archaeological sites	High (H)	1. Conduct operations only in approved areas. 2. Use recon party to identify and mark all sensitive areas and routes within the AO. 3. Use vehicle guides to direct vehicles and equipment into the AO. 4. Control vehicle speeds and movements.	Moderate (M)	TACSOP, para 10(a), OPORD - Camp Yukon Range Control Map, Camp Yukon Environmental and Range regulations. (ARTEP 5-145-32, MTP 05-2-0410, FM 5-36, FM 3-100.4.
	Use of smoke pots and grenades in sensitive habitat areas and civilian population areas	High (H)	1. Brief all leaders on proper use and deployment of smoke pots and grenades. 2. Use smoke only in approved areas. 3. Coordinate with range control before smoke operations. 4. Observe and calculate atmospheric effects on the dispersion and direction of the smoke areas. 5. Stop smoke operations immediately if atmospheric conditions change, or when notified by range control.	Moderate (M)	TACSOP, para 13(a), OPORD - Camp Yukon Environmental and Range Regulations. (FM 3-50, ARTEP 5-145-32, MTP 05-2-0917).
	Washing vehicles and equipment in or around water sources	Moderate (M)	1. Inform all leaders to conduct vehicle and equipment cleaning only at approved washracks before departure from Camp Yukon. 2. Ensure that leaders will inform and supervise soldiers.	Low (L)	TACSOP, para 14(a), OPORD - Camp Yukon Environmental and Range Regulations.

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) **MODERATE (M)** HIGH (H) EXTREMELY HIGH (E)

Figure G-7. Sample of completed worksheet for float-bridge construction(continued)